AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Canceled)

2. (Previously presented) The system of claim 27 wherein the processor causes the further execution of the step of associating a cost and a revenue to each valid product configuration.

3. (Previously presented) The system of claim 2 wherein the cost associated with each valid product configuration is comprised of a plurality of per option costs.

4. (Canceled)

5. (Canceled)

6. (Currently Amended) The system of claim 27 wherein the desired objective <u>of the company</u> is to maximize the profit <u>from the r number of product configurations offered to the company's customer base</u> ~~of a manufacturer or retailer of the product~~.

7. (Currently Amended) The system of claim 27 wherein the desired objective is to minimize the costs of <u>manufacturing the r number of product configurations offered to the company's customer base</u> ~~a manufacturer of the product~~.

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8. (Currently Amended) The system of claim 27 wherein the desired objective is to identify the r number of product configurations offered to the company's customer base that will increase the company's market share ~~maximize coverage of customer demand for the product~~.

9. (Currently Amended) The system of claim 27 wherein the r number of product configurations is a fixed value provided to the optimization model ~~is defined such that the number of product configurations in the optimum subset of valid product configurations is fixed~~.

10. (Currently Amended) The system of claim 27 wherein the optimization model determines the optimum value of r for the r number of product configurations ~~is defined such that the number of product configurations in the optimum subset of valid product configurations is variable~~.

11. (Currently Amended) The system of claim 27 wherein each feature of the product configuration is assigned a specific location and order within the n-dimensional vector array and wherein the value of each feature corresponds to the option associated with the respective feature ~~the multi-dimensional feature arrays represent the features in a fixed and non-modifiable order~~.

12. (Canceled)

13. (Currently Amended) The system of claim 27 wherein the step of applying mix-and-match rules to the n-dimensional vector array ~~multi-dimensional feature arrays to identify the valid product configurations~~ further comprises the step of conducting fast enumeration on partial product configurations.

14. (Previously presented) The system of claim 27 wherein the processor causes further execution of the step of defining configuration neighborhoods based on a relation structure,

wherein the configuration neighborhoods identify at least one valid product configuration captured by another valid product configuration.

15. (Previously presented) The system of claim 14 wherein the relation structure is an upgrade relation that identifies at least one feature having an option that is upgradeable for no additional cost to a customer of the product configuration having the upgrade option.

16. (Previously presented) The system of claim 14 wherein the relation structure is a convert relation that identifies at least one feature having an option that is convertible to another option at a respective conversion cost.

17. (Previously presented) The system of claim 14 wherein the relation structure is an acceptance relation that identifies at least one feature having an option that is acceptable to a consumer desiring a different option at a respective acceptance value.

18. (Previously presented) The system of claim 17 wherein the acceptance value is a probability that the customer will accept the acceptance option instead of the different option.

19. (Previously presented) The system of claim 14 wherein the relation structure is an acceptance relation that identifies a plurality of features, each feature having a respective option that is acceptable to a consumer desiring respective different options at a respective acceptance value, the acceptance value being the product of the probabilities that the customer will accept each respective different option.

20. (Previously presented) The system of claim 14 wherein the relation structure identifies at least one valid product configuration that captures another valid product configuration through an upgrade, conversion, or acceptance of at least one option.

21. (Canceled)

22. (Canceled)

23. (Canceled)

24. (Canceled)

25. (Canceled)

26. (Canceled)

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27. (Currently amended) A computerized system for identifying, in advance, generating an optimum subset of product configurations from a plurality of possible product configurations associated with a product, wherein the optimum subset of product configurations identify the limited number (r) of product configurations that should be offered to a company's customer base over a predefined future period of time to satisfy a desired objective of the company, wherein the product includes a plurality of available features[,] and wherein each feature includes including a plurality of available selectable options, comprising:

a processor;

a database for storing product configuration data and historical demand data associated with the plurality of possible product configurations, wherein each product configuration includes a specific combination plurality of choices of options selected from the plurality of features associated with the respective product; and

a computer readable medium that is usable by the processor and is operatively coupled to the database, the medium having stored thereon a sequence of instructions that when executed by the processor causes the execution of the steps of:

receiving product configuration data from the database representative of the plurality of possible product configurations;

based on the received product configuration data, representing every each product configuration in the plurality of possible product configurations mathematically as an n-dimensional vector a multi-dimensional feature array in a possible product configuration space,

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wherein each n-dimensional vector array identifies [[the]] a unique combination of options associated with its respective product configuration;

applying mix-and-match rules to the n-dimensional vector a multi-dimensional feature arrays in the possible product configuration space to identify invalid product configurations and, correspondingly, define a plurality of valid n-dimensional vector a multi-dimensional feature arrays in a valid product configuration space representing all valid product configurations as a smaller subset of the plurality of possible product configurations;

receiving historical demand data from the database for the valid product configurations, the historical demand data including a demand value for each respective feature and option of each respective feature associated with each valid product configuration;

analyzing the valid product configuration space via an optimization model to generate an optimum but limited subset of (r) valid product configurations from the plurality of valid product configurations based on the [[a]] desired objective of the company and the received demand values associated with each of the valid product configurations, wherein every each valid n-dimensional vector a multi-dimensional feature array in the valid product configuration space is analyzed and evaluated according to the desired objective of the company prior to identifying generating the optimum subset of (r) valid product configurations; and

outputting the generated optimum subset of valid product
configurations that <u>identifies the limited number (r) of product
configurations that should be offered to the company's customer base over
a predefined future period of time to</u> satisfy the desired objective <u>of the
company</u>.

28. (Canceled)

29. (Canceled)

30. (Previously presented) The system of claim 27 wherein the historical demand data
comprises data based on previous sales of the product.

31. (Currently amended) The system of claim 27 <u>further comprising including</u>
<u>forecasted future sales of the product as part of</u> ~~wherein~~ the historical demand data ~~comprises~~
~~data based on forecasted future sales of the product~~.

32. (Canceled)

33. (New) The system of claim 2 wherein the cost associated with a respective valid
product configuration is comprised of costs associated with a combination of options included in
the respective valid product configuration.

34. (New) The system of claim 27 wherein the step of analyzing the valid product
configuration space via an optimization model to generate an optimum but limited subset of r
valid product configurations from the plurality of valid product configurations is further based on
(i) the cost to manufacture each valid product configuration and (ii) the revenue value of each
valid product configuration.

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35. (New) The system of claim 27 wherein the optimization model uses branch-and-bound algorithms to solve linear programs to compute bounds.

36. (New) The system of claim 35 wherein the linear programs are then solved by using Lagrangian relaxation algorithms.

37. (New) The system of claim 36 wherein the Lagrangian relaxation algorithms involve maximizing a Lagrangian dual function using a subgradient optimization model.

38. (New) The system of claim 27 wherein the optimization model further comprises a pattern generation algorithm.

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